5-15-2019

EXPLAINING AN E-IDENTIFICATION FRAMEWORK IMPLEMENTATION USING DIALECTICS

Anar Bazarhanova
Aalto University, anar.bazarhanova@aalto.fi

Kari Smolander
Lappeenranta University of Technology, kari.smolander@lut.fi

Ilkka Lähteenmäki
Aalto University, ilkka.lahteenmaki@aalto.fi

EXPLAINING AN E-IDENTIFICATION FRAMEWORK IMPLEMENTATION USING DIALECTICS

Research paper

Bazarhanova, Anar, Aalto University, Espoo, Finland, anar.bazarhanova@aalto.fi

Smolander, Kari, LUT University, Lappeenranta, Finland, kari.smolander@lut.fi

Lähteenmäki, Ilkka, Aalto University, Espoo, Finland, ilkka.lähteenmäki@aalto.fi

Abstract

This article analyses the challenges of implementing a new electronic identification (eID) framework in Finland. We employ the theoretical lens of dialectics to explain how two opposing forces in the form of public and private actors, the government and banks respectively, engaged in a process of resistance and acquiescence. By interviewing the key organizations from both sides, we identify the rationale of the conflict, mechanisms that have led and may lead to further conflict, and the outcome. The root cause of the problems with the framework include the conflicting goals of the government and banks: the regulators' interests to create more competition in the market, generate cost savings, decrease the dependence on banks vs. the objectives of the banks to maintain the status quo. Moreover, the framework implementation practices, such as the hard enforcement strategy, inherent infrastructuring mindset of the government and communication problems, have considerably contributed to further conflict development. As a result, divergent views on the framework architecture and the pricing models are the outcomes of the confrontation. Our findings emphasize the importance of strategic and operational coherence in the governance of a changing ecosystem with a proprietary banking platform playing a role in a national eID scheme.

Keywords: electronic identification (eID), ecosystem transformation, BankID, e-identification infrastructure, dialectics theory

1 Introduction

According to the European Union's recent ranking on the integration of digital technology, the Nordic countries retain their leadership positions as the most advanced digital economies in Europe (European Commission, 2018). Well-established digital identification infrastructures are justifiably regarded as one of the main contributors to the success. In Finland, like in Sweden and Norway, eID services are procured in the open market with bank identifiers as the de facto method of e-identification both in private sector and in e-governmental services. Despite being a pragmatic solution, the market-procured approach involves a number of challenges, namely market dynamics, technological changes, the regulation and political interests that influence the power relationship between government and banks when negotiating a common approach to the governance of an eID infrastructure (Medaglia, Hedman and Eaton, 2017a). Banks ownership of the identification infrastructures has been criticized for hindering competition and for taking an advantage of their market dominance position (Murphy, 2012). Among other criticisms is the geographical limitation of the method, which has inherent limitations in scaling into a global system (Teigland et al., 2018).

Nevertheless, the Nordic model of bank-provided eID solutions is a success story. While some countries are attempting to replicate the BankID system (e.g., for Ukraine, see www.bankid.org.ua) or develop

second-generation BankID systems (for Norway, see www.bankid.no/xid), other countries are making radically different choices. Inspired by Estonian advances in establishing government-issued e-identification, the state of Finland is seeking to change the BankID dominance. The government seems to be in a constant deliberation whether to create a state-issued eID solution, but the banks do not want to give up the strong position of BankID. In this article, we describe the governmental effort to diminish the role of banks in Finnish eID ecosystem. We wanted to understand internal conflicts and contradictions among actors involved in the transformation of a digital infrastructure - a nation-wide e-identification method. At a more abstract level, this paper looks into the problem of dialectical relationship behind the development of an information system (IS) infrastructure. In order to answer this question, it is useful to break it down into a dialectic between opposing views on the eID infrastructure, with government and regulators representing the thesis, and banks the antithesis.

Thesis: The government should fully control the eID infrastructure.

Antithesis: The market is the best guarantor for a cheap and reliable eID infrastructure.

Investigating the case from two perspectives helps us to observe fundamental arguments of the platform owners and the government. For example, due to increasing online fraud and identity theft, the eID solutions need to satisfy the state-of-the-art security and privacy requirements. This involves significant investments from system owners, especially when the identification infrastructure becomes increasingly used, leading to further issues of costs (Whitley, Gal and Kjaergaard, 2014). IS scholars, for example, raise questions as to whether the maintenance costs of the increasingly widely used infrastructures should be shared by the relying parties that receive indirect benefits from using it (Whitley et al., 2014; Patala, Albareda and Halme, 2018). The motivation for our study was our observation (Bazarhanova, Yli-Huumo and Smolander, 2019) of the significant variance of views between different actors concerning changes to the infrastructure, their costs and benefits, which requires the actors to engage in negotiations to resolve the conflicts caused by the variance.

The remainder of the article is organized as follows. We introduce the case by providing a snapshot view of the framework implementation process. In the background section, we discuss research on eIDs and present the theoretical lens of dialectics. Then, we present the research approach, data collection and analysis of the empirical data. After presenting the findings, we turn to the discussion, where we highlight the contributions of the study to research and practice, and we also discuss limitations of the study. The paper ends with conclusions.

1.1 Case description

In August 2018, the Ministry of Finance in Finland announced the government's decision to explore alternative methods for electronic identification of citizens after 2020. This far identification in Finland has been dominated by the bank-provided eID solutions, with a total number of 100.9 million transactions in 2017[1]. Current strong customer authentication (SCA) methods in Finland are online banking identifiers (BankID), mobile certificates from telecom operators (MobileID) and state-issued certificate cards from the Population Register Centre (FineID), the shares of which in public services transactions were 96%, around 3% and less than 1% percent respectively in 2017. Identification method providers (IdP), for example bank and telecommunications companies, provide both public and private sectors with their SCA solutions, such as bank identifiers or mobile certificates.

The decision to explore alternative identification methods was preceded by two rounds of partially successful public procurement in 2017 and 2018, where some banks as IdPs and the public sector as a procuring entity could not agree on mutually acceptable pricing models. In the most recent (the third) procurement in October 2018, the agreements were finally reached between the banks and public sector. However, the use of bank-provided eID solutions is secured temporarily and only for the period of 2019 - 2020. Finland, similar to other Nordic countries, follows a market-procured model where the IdPs can offer their audited and qualified solutions to the public sector. The need for a renewed procurement was

[1] https://www.suomenpankki.fi/en/Statistics/payments-statistics/tables/

created by the maximum budget of 5 million EUR per year to cover the identification costs of the public sector; and the newly introduced e-identification framework – Finnish Trust Network (FTN) (Ministry of Transport and Communications, 2016) that came into force in mid-2017.

The FTN framework, which was created in compliance with the EU Regulation on electronic identification and trust services (eIDAS), has introduced a number of architectural and business changes in the eID ecosystem. First, it introduced the role of service brokers between the identity providers and the relying parties. The service broker is the entity that delivers SCA solutions to various relying party services, i.e., e-commerce service providers or e-government platform. The idea behind the FTN framework creation was to help relying parties to acquire the eID services via a single proxy, i.e., one point of technical integration and simplified contractual agreements, thus, expanding the use of eIDs. Second, the framework has put a price cap on BankID identification transactions, reduction was from about 0.5 to 0.1 EUR. It has also authorized the chaining of electronic identifiers, i.e., a recreation of new eIDs (e.g., MobileID, a competing solution provided by telecoms) based on existing strongly authenticated eIDs (BankID method) in return for a fee of 2.5 euros max.

2 Theoretical background

This section provides a short overview of the research on e-identification. We also justify the use of dialectics as the theoretical lens.

2.1 Research on e-identification

With an increasing number of services provided online, digital identification plays an important role in societies. Thus, the research on electronic identification schemes has not been void. Scholars from different fields have investigated policy, technology, societal issues in a wide variety of ways. As pointed out by scholars (Whitley et al., 2014), an absolute analytical separation of technological and social issues of digital identity is proving to be increasingly unhelpful in studying contemporary practices. As a result, the vast majority of studies analyse the public sector eIDs by laying out technological (Marsalek et al., 2017), organizational (Melin, Axelsson and Söderström, 2016) and legal (Lentner and Parycek, 2016) dimensions such as the articles analysing the Danish (Hoff and Hoff, 2010), Norwegian (Murphy, 2014) and Swedish cases (Grönlund, 2010; Söderström, 2016).

A large proportion of this literature focuses on national identification schemes. See, for example, articles about the path dependency of national electronic identities (Kubicek and Noack, 2010), the emergence of national eID schemes (Söderström and Melin, 2012), policy options for the regulation of electronic identity (Hoikkanen, Bacigalupo, Compano and Lusoli, 2010) or the role of trust and public value in electronic identity management (Seltsikas and O'keefe, 2010).

A specific type of market-procured eID schemes that are widespread in the Nordics (Husz, 2018) have also been widely investigated. Several publications have appeared documenting the banks provided eIDs due to the presence of complex public-private relationship between actors (Medaglia et al., 2017a; Medaglia, Hedman and Eaton, 2017b). Bank identifiers reuse as a national eID infrastructure have been criticized for technical weaknesses and vulnerabilities in (Espelid, Netland, Klingsheim and Hole, 2008; Gjøsteen, 2008) but also the benefits (Eaton, Hallingby, Nesse and Hanseth, 2014) have been emphasized.

While acknowledging the importance of pure technological or policy aspects of identification mechanisms, we choose to focus primarily on the information systems perspective: the interplay of policy, technology and management questions around identification at the organization level. A recent cross-country comparison on the emergence of a national eID infrastructures in Sweden, Denmark and Norway (Eaton, Hedman and Medaglia, 2017) is a particularly relevant research to our study. It covers the period from 1990s to 2016, where authors explain a complex interplay of interests, governance and, resources among the government and the banks. We position our paper as the missing part of the Finnish case to complement the research on BankID evolution in the Nordics while focusing on a contemporary, more radical phase of transformation.

2.2 Dialectics theory

In a study referenced above (Eaton et al., 2017), authors analyse how the balance of converging and diverging interests, the shift in resources from independent to interdependent, and the governance structures influenced the process of a national eID infrastructure establishment, which they theorize as a dialectical process model of evolution. Likewise, we choose the dialectical process lens because of the evident conflicting nature of the process in our case. We did not specify an a priori perspective but induced it during data analysis (Robey, Ross and Boudreau, 2002). In a dialectical process model (Van de Ven and Poole, 1995) the process can result in four different outcomes: synthesis, pluralism, thesis or antithesis. An outcome may lead to another contradicting antithesis that sets off another dialectical process.

Dialectical process theory is one of four types of "motors of change" in organizations proposed by Van de Ven and Poole (1995). Life cycle, teleological, and evolutionary mechanisms may serve as alternative theories in explaining change in organizations. At a meta level, process theorizing is concerned with how something happens and these four types of theories prescribe the rules and processes of how entities interact ideally (Van de Ven and Poole, 1995). Their motors of change also differ according to the sequence of change events. While a prescribed mode is about incremental and predictable change process (such as in evolution and life cycle models), constructive motor which includes dialectical and teleological models, generates novel, unprecedented "departures from the past" (Van de Ven and Poole, 1995).

We chose the dialectical model in our study, because, first, we examine the interaction between two distinct groups – public sector actors and banks – thesis and antithesis. Here, we refer to the public sector actors as a stakeholder group including various internal and external stakeholders and other related governmental agencies involved in decision-making (Axelsson, Melin and Lindgren, 2013). Public-private collaboration in developing e-government services is known to be bound to the distribution of power dependence between the government and the private actors (Medaglia et al., 2017b). Thus, secondly, the entities in our case confront each other and engage in a dialogue. The sequence by which the thesis and antithesis confront each other is highly unpredictable and can result in different outcomes at different points of time. Dialectical process research seeks to explain how the dialogue and confrontation emerges, develops, and diminishes over time. As suggested by Van de Ven (1992), "it is even better to undertake real-time study of strategic change processes as they unfold". Our case of eID development in Finland exhibits a high degree of uncertainty on the ground that it is a contemporary phenomenon. Lastly, the outcome of confrontation could consist of either a new entity (synthesis); the defeat of one entity (either thesis or antithesis) or a conflict (pluralism). The outcome may lead to another cycle of a dialectical process representing a second-order change (Van de Ven and Poole, 1995).

3 Research approach

This section describes the processes of data collection and analysis. We chose a qualitative case study approach for this study (Yin, 2011). We use the abductive approach with the dialectics lens in mind and the data analysis as in Grounded Theory (Strauss and Corbin, 1990).

3.1 Data collection

This article reports findings that are part of a larger research project focusing on eID development since 2016 (Bazarhanova, Yli-Huumo and Smolander, 2018; 2019). During this project, we have already collected observations of eID in multiple data collection rounds. In this report, we analyse only the interviews that were conducted during the year 2018, in which the actors were asked about the framework implementation progress.

	Case organization, interviews	Role in eID ecosystem	Interview period, 2018
1	The Finnish Financial Supervisory Authority (FSA)	Financial regulatory authority	Winter
2	Ministry of Finance, MoF (x2)	Regulatory body	Winter, spring
3	Bank 1	BankID provider	Winter
4	Bank 2	BankID provider	Summer
5	Bank of Finland	Central bank of Finland	Spring
6	Broker company (x2)	Incumbent Service Broker (SB)	Winter, spring
7	API consultant	Public sector consultant	Spring
8	Technology company	Technology provider, ambitious newcomer in eID	Spring
9	Finnish Federation of Financial services – Finance Finland (FFI)	Representative of the banks and the Finnish financial sector	Summer
10	Finnish Communications Regulatory Authority (Ficora)	Public authority and regulatory body	Summer
11	MyData expert	Industry advisor	Summer

Table 1. Case-organizations interviewed and their roles. Two banks cover around 73% of the population in Finland.

Table 1 provides a summary of all interviews. The interviewed experts come from the following organizations in Finnish eID ecosystem: identity providers, service brokers, industry advisors and various governmental organizations that supervise and orchestrate the eID market in Finland. The interviews were semi-structured (Yin, 2011) and lasted on average 45 minutes. The total interview time was 9 hours 45 minutes. We recorded, transcribed and analysed each interview with a qualitative data coding and analysis tool, Atlas.ti. Each interview began by asking the interviewee's position, background, experience and role in the organization. The interviews covered the following topics: the role of the organization in the eID ecosystem; the challenges, issues, and experiences with FTN framework; opinions on implementation strategies and justifications.

In addition to collecting different views from banks, government, and independent organizations, we collected secondary data from government reports, press releases, reports and news found online. The secondary data is described in Table 2.

Date published	Type of data	Reference
31.10.2014	Official document, FFI's (Finance Finland) response on FTN and the changes to strong electronic identification	https://bit.ly/2pZ7EhK
12.11.2014	Official document, A new law may endanger e-commerce, FFI	https://bit.ly/2P8ZPUC
31.5.2016	Official document, Request for opinion from the Ficora on FTN, FFI	https://bit.ly/2AhlH8i
06.06.2016	Official document, The statement of FFI on unrealistic transition times to FTN	https://bit.ly/2CPFmyx
07.12.2016	Explanatory notes to Regulation 72: Electronic identification and trust services	https://bit.ly/2DCMgqp
04.10.2017	FICORA's explanatory memorandum on the provision of weak and strong identification services	https://bit.ly/2DDyqE7
04.10.2017	Memorandum on questions relating to interpretation raised in negotiations between trust network members	https://bit.ly/2R7lwCu
15.09.2017	Opinion statement, FiCom's statement on the need for price regulation and supporting the FTN	https://bit.ly/2AfJYLV

Accessed 18.10.2018	News, Is BankID positioned for the future?, CEO of the Norwegian identity scheme BankID	https://bit.ly/2P97m5K
28.08.2018	Press release, The state is exploring alternatives for citizens' electronic identification, Ministry of Finance	https://bit.ly/2LzSKGK
28.08.2018	News, Governmental opinion that BankID usage is too expensive for the state	https://bit.ly/2NP9f30
30.08.2018	News, FiCom about the increase in the use of MobileIDs	https://bit.ly/2yJ0emB
30.08.2018	News, In addition to the obsolescence, the BankID will cost more to the government in the future	https://bit.ly/2CS34dz
24.08.2018	New step taken towards a common KYC infrastructure	https://bit.ly/2P7sfhT

Table 2. Secondary data.

3.2 Data analysis

In the data analysis, we used the techniques of the Grounded Theory method. This systematic approach to qualitative inquiry helped us to deal with the rich data we collected that is full of diverging perspectives, opinions and insights (Strauss and Corbin, 1990). We analysed the data in three phases: open, axial and selective coding. The data analysis started after all interviews had been conducted. We looked for the events related to the implementation of the Finnish eID framework, including key actors' involvement, important decisions and events, challenges and limitations that are related to the governance, as well as development and future use of eIDs.

It became quickly obvious that the contradictions could be broadly categorized in two opposing views: views of the banks providing the BankID and the rest of Finland led by regulators. By highlighting the most apparent contradictions, we coded them in relation to the subjects of disagreement: pricing, architectural settings of the new framework, strategies employed by parties as well as planned objectives and actual outcomes. The result of the open coding phase was an unstructured list of characterizing codes attached to the text and notes to explaining the content of codes, see Table 3.

Extracts from the data	**Codes used**
Thesis: Banks' perspective as providers of BankID	
"Tupas [Finnish BankID protocol] is definitely a legacy and it will be replaced with new protocols during the next year. It is an old technology and description, has drawbacks and so on", Bank 1.	*Problem definition*: technology obsolescence;
"The lawmakers have their own goals. That was, I guess, the explicit goal of the government to break the monopoly. But it does not solve the problem, it just subsidizes the new players", Bank 2. "It was some kind politician game play", Bank 2.	*Goals and interests:* break the monopoly and open the market;
Antithesis: governmental and regulatory perspective	
"There is always resistance, independent in which industry it happens. When somebody forces you to grant access to your infrastructure. That was also in energy and telecom industries before", FSA. "And in the end one reason is of course the old market players the banks, especially the big ones, want to like to keep the market positions", Ficora.	*FTN approach* is similar to access regulation in telecom; *Resistance* has been expected; *Resistance cause* is granting access to your infrastructure;
"One bank for example left an offer which was at least two times more expensive than the current contract. And we don't know how they figured out the price, they doubled", MoF. [This happened because the offered price structure was the regulated 10 cents + the brokers margin].	*Conflict*: pricing, cost compensation; *Conflict*: unsuccessful procurement rounds;

"But during the [first procurement] it was very obvious that some key players they did not realize they could sell their own device and do their own broker, some eID providers were expecting that there needs to be always an external service brokers", MoF.	*Communication* problems; *Process*: regulation interpretations difficulties, implicit messages;
"TUPAS [the cost of implementing it] is way too expensive and it is a bank monopoly, it is difficult to scale it for all sort of services because it is too expensive. Why is it so expensive? I don't know – it is like a money-making machine for banks. It definitely did bring many benefits in Finland and it has been working nicely in Finland, but it is kind of reaching its limits", MyData expert.	*Problems* definition: market leadership, scalability issues, expensive, local protocol;

Table 3. Open coding examples

In the phase of axial coding, we identified the relationships among the codes from the open coding phase. By categorizing the open codes into groups and merging similar ones and disintegrating different concepts, we derived the elements contributing to the dialectical process. The subjects of conflict elements along with the definitions of the matter and representative quotes are presented in the Findings section, see Table 4. As the views of interviewees were not always diverging, in the same table we also outline the points of agreements among stakeholders. The objective of selective coding involved the harmonization of the axial codes from the previous phase, see Table 5. We tried to develop and refine further the discrete concepts of conflicts described above. The objective of this phase of coding was to identify the abstracted, yet empirically grounded, core concepts of the dialectical rationale, which are discussed in detail in the next section.

4 Findings

In this section, we explain all of the conflict items or dialectics and illustrate how they influenced each other as the process unfolded. The sequences of change events in dialectical process theory are (1) thesis, antithesis → (2) confrontation → (3) synthesis or thesis/antithesis or pluralism. At the moment of writing (October 2018) the ecosystem is in the stage (3) of pluralism, see Figure 1, and we believe that our analysis will help in understanding the progress of the dialectical process and in finding ways that consensus can be achieved.

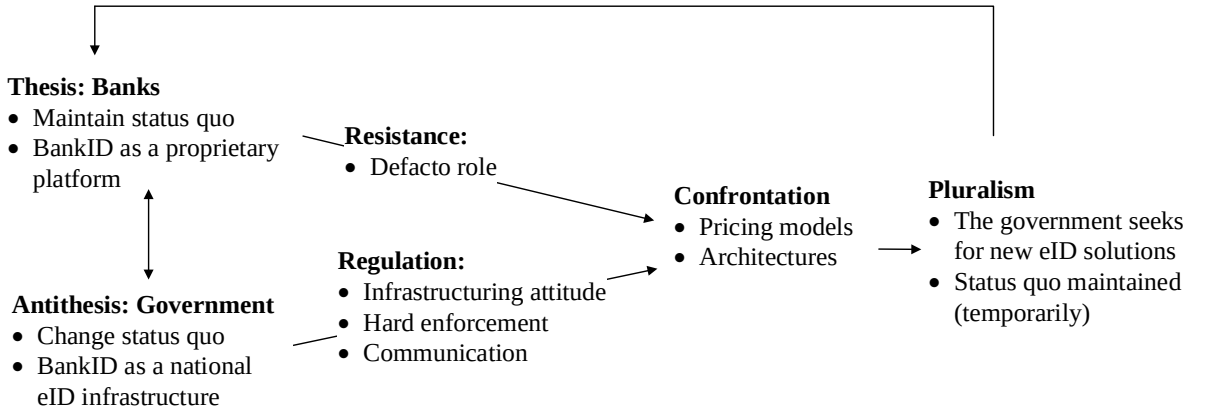

Figure 1. Main dialectical process model. Thesis and antithesis consist of two contradictory assumptions and goals. The government employs the regulatory mechanism to achieve their goals and encounter resistance from the banks. Two sides engage in dialogue on budget, business and technology aspects. Three procurement rounds lead to a synthesis, which appears to be temporary, while the pluralism of opposing views dominates.

The first conflict concerns a *contradiction in goals*. The apparent interests of BankID providers in providing BankID services can be explained by sustaining revenue streams from selling the services, and by the strategic importance of having a leadership position in the market that provides an access to customers. The Finnish government's attitude towards the banks' dominance in eID provision is more

critical, yet opaque. On the one hand, the state has benefited considerably from the wide dissemination of BankID. On the other hand, one of the governmental functions is to regulate monopolistic behaviours in the market. Although BankID is not a natural monopoly, due to the existence of the alternative e-identification methods (MobileID and FineID) the entry barriers in the market for new players are high. The objectives of FTN framework, according to the regulators, is (1) to expand the adoption of eID among service providers, (2) to comply with the most recent budget coming from FTN, and (3) to create more market competition by (4) breaking the banks' 'monopolistic' position. The objectives of the state exhibit not only an apparent antithesis towards the banks but also an acute analytical asymmetry, i.e. creating more competition in the market by restraining the market leaders in order to increase cost savings and enable more widespread adoption of eID. One of the banks commented:

> *"It [the framework] is pushing down the costs of new entrants so [new entrants] don't have to ask the prices from the customers. That way the competition can grow. But the work is kind of subsidized by the banks, which is not fair at all"*.

The second conflict, termed *the power to regulate* concerns the different perspectives used in analysing BankID. BankID, first of all, is a proprietary platform developed and managed by banks; it is also a national e-identification infrastructure, which is important for the (digital) functioning of the country. The use of familiar bank identifiers for accessing digital e-governmental services helped in achieving high citizen use of e-government services. However, the primary use of BankID is in banking, as part of compliance with customer due diligence standards, and only secondarily as a service offered to various relying parties from the public and private sector. Therefore, banks have a different understanding that the state regarding the involvement of regulators in business-model decision-making, and this as a result brought the two sides into a confrontation.

The framework implementation practices have exacerbated the disagreements between two sides. According to Finnish banks we interviewed, the Finnish regulators should have re-evaluated their choice of whether to employ *hard or soft power* when managing the transformation, and this we regard as the third conflict.

> "*[Making changes by means of law] is quite often considered a hostile way of doing it, and people are not voluntarily doing it. Definitely there could have been another soft way to build the FTN from a business perspective and [the method of doing it by law] is extremely slow*", commented Bank 2.

This refers to the use of soft power in trying to achieve co-opetition, rather than unilaterally forcing the changes. According to one of the experts, focusing on the decision-making group's cohesion, building trust, and achieving mutual understanding between the stakeholders could significantly contribute to the openness for compromise and the willingness to find win-win solutions.

The fourth conflict arose from *the 'infrastructuring' attitude* that is in the core of the FTN framework. By infrastructuring we imply the concept of making the platform more physical (Constantinides, Henfridsson and Parker, 2018) and pushing it to act as the backbone and enabler in the ecosystem. The framework has been repeatedly referred to the kind of Access regulation used in communications networks (European Commission, 2002), which sets obligations on telecom network operators with significant market power for when they grant other companies in the telecommunications sector access to their networks in return for a fee. The infrastructuring issues were raised by banks, such as:

> *"How can the state come in and just take something the banks have done and created and say that you will have to give this value to other players"* have been responded to by regulators in the form, *"I know that the banks are giving that message, but in the end it is quite a minor issue"*.

Such an attitude points to the path dependency of the approaches employed by regulators to supervising the market. The digital identification infrastructure has been treated similarly to physical telecommunication infrastructures. The following comment is in line with this view:

> *"… banks have to think about big questions. Do they still want to provide the UX [user experience] themselves or just become an infrastructure company that maintains the infrastructure and let someone else do the UX things*"?

The fifth conflict over framework implementation practice refers to *communication problems*. The two contrasting views point to the opposing experiences of the two sides. Whereas the banks describe the process as "*lacking discussion and a shared understanding among the stakeholders*", the regulators refer to full transparency and openness in communication that "*they worked closely with industry in making this framework, so all the market players had the ability to participate*". In the words of one of our interviewees from the banks side:

> "*After these two [procurement] rounds they finally realized that it is an impossible scenario, and they started to actually rethink the whole setup based on all the comments that we have built up during the year. We can't see how this [the framework] will ever work, we are stating so everywhere*".

The *pricing model and new ecosystem architecture,* which we regard as sixth and seventh elements, led to further disputes between the banks and government. The initial identification and its price compensation was one the main source of disagreement between the two sides. Banks describe the initial identification as an expensive process, which is part of their Know Your Customer (KYC) requirements checks, where the customer must physically visit the bank office.

> *"The cheapest pricing that we know for doing the KYC on internet is around 5 euros. That is the digital onboarding. nothing physical. And the government say they will pay only half of it", FFI.*

Another stakeholder group (FiCom, alliance telecom operators) supports the price cap introduction ("*the costs of non-identification regulation should be taken into account when determining the maximum price for initial identification*") by referring to the requirement for banks to perform KYC checks as part of banking-specific regulations. The new architectural setup in the framework brought regulators into an increasing conflict with incumbent banks. Chaining of the initial identification, that is, where new strong e-identifiers (e.g., MobileID) could be created based on existing credentials (e.g., BankID), was not received positively by the banks. MobileID method providers have promptly supported the chaining concept stating:

> "*The development of the market without the legislator's involvement would have been slow*".

The eID chaining concept resembles the number portability regulation, where consumers can change their mobile operator while keeping their old phone number.

Because of the confrontation, service broker companies have experienced difficulties in negotiating with some banks. The banks were described as reacting with a "slowdown" tactic, also known as an "Italian strike", where workers perform their tasks exactly as they are required, but no better (or no faster in this case). The semi-successful procurement rounds with the public sector have led to a pluralism phase. Although the agreements with all banks were, in fact, reached after the third bidding round, the synthesis accomplishment is a temporary arrangement. The intention of the state to investigate new methods for national eIDs manifests the persistence of opposing views and shows a distrust to the success of the planned FTN approach. Table 4 offers a more detailed description of each dialectic element and Table 5 offers the categorization of the element type.

Dialectic name	**Explanations for the elements in the dialectical process, code examples**	**Example quotes**
Dialectic of goals	Conflicting goals to maintain status quo and to change it. Moreover, the asymmetry of objectives and political interests in the objectives to "increase the market competition" and "break the banks' monopoly".	"*The main purpose is that there can be the real competition", Ficora.* *"I don't see it anymore as the effort to increase the competition I see it as the effort to keep the budget", FFI.*

	Goal: open the market; *Objective*: cost savings; *Political interest*: cut costs and to weaken the role of banks in eID; *Goal*: sustain status quo;	*"Banks are not supposed to dictate how and when people authenticate".* *"We don't understand the logic behind this. As far as I know, there are not too many people in this country understand the logic".* *"The walls are coming down, banks cannot live in an ivory tower anymore".*
Dialectic of power to regulate	The degree of involvement of the regulators in decisions about the technical, business changes in the infrastructure led to the conflict. The governments' perspective to regulate the national infrastructure and banks' perspective to control their proprietary platform.	*"First of all, technical things should be never governed by law at all. FTN of course [has] some of the concepts can be there somehow, but there has been way too much regulation touching the business models", Bank 2.* *"The world is moving faster than the lawmakers" (banks) vs "The development of the market without the legislators will be too slow", (Ficom, telecom alliance).*
Dialectic of infrastructuring	Some core ideas in the framework resemble the Access regulation (European Commission, 2002) in telecom industry. Banks' resistance to a forced opening of their e-identification infrastructure. *FTN as* the access regulation in telecom, employing familiar strategies; *Approach*: banking resembles telecom;	*"There is always resistance, independent in which industry it happens. When somebody forces you to grant access to your infrastructure. That was also that has been in energy and telecom".*
Dialectic of hard vs. soft power	Implementation style described as hard enforcement and the lack of motivation to search for win-win solutions provoked the conflict further. *FTN as* the hostile way of governing the market;	*"Because the technology is just a technology and the government makes the legislation which makes us invest in something and there is no payback", Broker company.* *"I would say the way FTN was built, kind of forcing it to the model they like. That does not improve innovation at all but makes companies protective almost hostile to each other", Bank 2.* *"Yes, the broker role and lower prices are a good idea. But the approach was very hostile, Bank 2", "[Could have been] some soft ways to boost kind of cooperation between companies", FFI.*
Dialectic of communication	The problems related to the lack of discussion and common understanding between sides contributed to a confrontation. *Contradiction*: made closely with the industry (regulators view); *Resistance* was expected, unsuccessful procurement of eIDs was not (regulators view); *Dialogue*: misunderstanding why negotiations are taking long; *Dialogue*: the regulation interpretations difficulties;	*"But we made this closely with industry, so all the market players had ability to participate", Ficora.* *"I don't know – there was some kind of lacking the discussion and understanding", FFI.* *"They let us know in a politician way – you have to read between the lines what they expect", Bank 2.*

Dialectic of changes to the architecture	Disagreements on the new ecosystem design by (1) putting service brokers between the e-government platform (Suomi.fi) and IdPs and (2) eIDs chaining, i.e., creation of new eIDs based on existing; *New architecture* by not treating Suomi.fi as a full broker as "the biggest design error"; FTN's strategy to attract new IdPs by allowing them not to charge the end users, i.e., subsidizing newcomers, ("exploiting" the incumbents);	*"Actually suomi.fi should be the broker. And that is the problem", FFI.* *"Inserting the brokers into the value chain, how could it in theory work if you have got a service that has a price cap, and then you insert a player in between, how could that cut the cost? That kind of controversies", FFI.* *"Well I think it is mainly legal issue, it is kind of there is no governmental service provider mess with the market", Ficora.*
Dialectic of changes to the pricing model	Disagreements on cost compensations for first-time identification (2.5 EUR) and that the regulation allows the digital identities chaining, and creating a potential "free riders" problem;	*"Well in the end the old players get the fee from using it. … What banks have said that it costs a lot … the actual cost might be quite a little bit … it is quite minor part. I think it is not so big issue", Ficora.* *"Unexpectedly it looks like that state said that they will get this price or little less. And it will never work", Bank 2.*
Agreement points	Apart from conflicting views there were common understanding and agreements on the following issues: 1. TUPAS is a legacy protocol and the need for legacy software protocol replacing; 2. Service broker role is the advantage for relying parties; 3. Lower prices for eID transactions;	*"Tupas is definitely a legacy and it will be replaced with new protocols during the next year. It is an old technology and description, has drawbacks and so on", Bank 2.* *"Definitely the trust network that you can buy it from one broker is a brilliant thing", Bank 1.* *"We would have done it anyways, voluntarily without the FTN one day. But this has just speeded up the change a bit", Bank 2.*

Table 4. Elements contributing to the dialectical process. First two elements are inherent to the nature of two opposing forces. Next three elements refer to the implementation practices, which are subject to accommodation and fine-tuning. Last two conflict elements are the consequences of the dialectical situation.

Summary. The root cause of the problems with the FTN include the conflicting goals of the government and banks; that is, the regulators' interests to create more competition in the market, cost savings, decrease the dependence on banks vs. the objectives of the banks to maintain the status quo. The dual role of the BankID as a proprietary platform and a national eID infrastructure also contributes to the conflict. The framework implementation practices, such as the hard enforcement strategy, inherent infrastructuring mindset and communication problems, have considerably contributed to further conflict development. Divergent views on the framework architecture and the pricing models are the outcomes of the confrontation.

Legitimacy	**Implementation practice**	**Solution features**
Goals (political interests, objectives)	Communication	Architecture
Power to regulate	Hard vs. soft power	Pricing model
	Infrastructuring attitude	

Table 5. Dialectical process elements organized by their types.

5 Discussion

In this study, we identify the challenges faced by regulatory bodies in attempts of getting the changes that meet private providers' needs while simultaneously following national and EU regulations. Moe et al. (2017) also studied the public procurement of information systems and showed that on one hand, the goal of regulators is to acquire a system that best suits the requirements; on the other hand, the regulators can be restricted by the limited dialogue with participants in the interests of equal opportunities and transparency. Banks on the other hand, as main players in financial markets, are facing new challenges (and opportunities) stemming from digitalization or processes and new technologies (e.g., decentralization brought by blockchain), new regulations (e.g., PSD2) and rapidly changing global landscape (fintech start-ups and global platforms). While a multitude of overlapping regulations and budget controls restrain the regulators side, the banks' resistance in implementing the changes are because they are for-profit organizations.

Our theoretical contribution is a nuanced understanding of how the dialectics play out in the transformation process of a nation-wide e-identification infrastructure. Unlike previous research on e-identification schemes, we explicitly focus on stakeholders' involvement in the process of resistance and acquiescence and the role of their inherent contrasting viewpoints in the development of a dialectical situation. While the dialectical situation in Finland will change over time, the thesis and antithesis whether the government or private sector should fully control the eID infrastructure will remain. This is in line with the discussions in Moe et al. (2017) and Nordheim & Päivärinta (2006) who raised the question on the importance of a conscious search for contradictions, acknowledgment of which should lead to a suitable strategy of reaching the synthesis. In other words, by considering the dialectical elements on legitimacy (goals and power to regulate) as constant, changing variables on the implementation practice (communication, power and an infrastructuring attitude) and solution features (architecture and pricing model) could result in different outcomes. This study forms a relevant case for future research on digital infrastructure evolution as a result of dialectical dynamics in public-private sector relationship.

Finland is not the only country where BankID is the dominant e-identification method; Sweden, Norway and Denmark also rely on market-procured eID infrastructures. Söderström (2016) studied the introduction of a similar public sector eID framework in Sweden and found the negative consequences in the processes of framework introduction due to ignored or unresolved resistance from affected actors. Unlike the Finnish FTN, Swedish eID framework's approach was to stimulate the market without suppressing the incumbents (i.e., no price regulations or eIDs chaining). It is important to know that Sweden's BankID follows a four-corner business model, i.e., there is a trust agreement that allows for the roaming of BankID requests between participating banks. Governments seem to react differently to an increased dependency on the private sector: some regulative efforts, as in Finland, seek to eliminate the legacy ties to banks, while others, e.g., in Sweden, create regulations with these public-private inter-dependencies in mind. This poses an interesting research question whether the different cooperative or antagonistic modes coming from the government are reciprocally dependent on the level of cooperation among banks themselves.

There are at least two implications for practice from our study. First is about governance of public and private relationships. The use of dialectical process model has enabled our understanding of the conflict roots, mechanisms that created greater conflict, and the consequences. The governance aspect of the transformation seems to be one of the main problems contributing to the pluralism phase in the Finnish case. Clearly, the ecosystem needs a strong leader organization to coordinate the actors within the groups and across the ecosystem. As a practical advice, the literature suggests the benefits of creating a neutral body when managing such public-private ventures (Eaton et al., 2014). As the government's view on the case is not necessarily stable over time, there is a need for a strong orchestrator that is capable of regulating the big players, defining clear rules and aligning the interests. In a similar study of public-private partnerships in Denmark (Medaglia et al., 2017b), the authors emphasize that for the successful establishment of common e-government infrastructures the parties need to aim for achieving mutual benefits that require overcoming any legacy thinking. This entails, unsurprisingly, collaboration and openness of the involved parties to envision how they can reach common goals.

Second, our findings raise important questions related to the long-term sustainability of public-private infrastructures. In the early years of digitalisation of the e-government services, also when the national FineID card proved to be unsuccessful, the solution provided by the banks was a 'lifesaver'. With the transaction volumes growing exponentially, and the price per transaction not decreasing fast enough, the mood changes more towards changing the status quo. We observe that the need and importance of full control over the infrastructure changes relative to the economic dependence. The tensions we found indicate that the problems of lack of resilient business models in public-private partnerships have not been solved (Teece, 2018). This indicates a strong need for future research on policy developments as well as empirical studies investigating the success factors and evolution of similar market-procured infrastructures.

Although this is not the first study of an IT procurement process in the governance of public-private infrastructures using dialectical process lens, our findings are original and provide implications to policy-makers and practitioners. In this article, we report the conflict items that were identifiable from the Finnish eID case. In our analysis, we focused on the explicit search for contradictions and pluralism of a short period. In future research, our plan is to observe how these dialectics play out over time.

6 Conclusion

Market-procured e-identification mechanisms raise significant policy, technological, managerial and societal questions. Different governance solutions can emerge as the result of converging or diverging interests and interdependency of resources between the private and the public sector over time. We observed the conflicts in the Finnish implementation of the changes to the market-procured eID infrastructure. The conflict roots come from opposing goals of the government and the banks; as well as the dual role of the BankID as the proprietary platform and the national eID infrastructure. However, the conflict has been amplified by the framework implementation practices that include hard enforcement strategy, inherent infrastructuring mindset of regulators and the lack of communication. As a result, confrontation on the framework architecture and the pricing models led to the pluralism phase, i.e., lack of consensus. Our analysis shows how the explicit goal of eliminating the dominant role of a market-procured solution manifests a larger concept of lack of integrity in public-private collaboration. Future development would require new models of collaboration with clear mutual incentives and benefits for both public and private sectors.

References

Axelsson, K., U. Melin and I. Lindgren. (2013). "Public e-services for agency efficiency and citizen benefit—Findings from a stakeholder centered analysis." *Government Information Quarterly*, *30*(1), 10–22.

Bazarhanova, A., J. Yli-Huumo and K. Smolander. (2018). "Love and Hate Relationships in a Platform Ecosystem: A case of Finnish Electronic Identity Management." In: *Proceedings of the 51st Hawaii International Conference on System Sciences* (pp. 1493–1502).

Bazarhanova, A., J. Yli-Huumo and K. Smolander. (2019). "From platform dominance to weakened ownership: how external regulation changed Finnish e-identification." *Electronic Markets*.

Constantinides, P., O. Henfridsson and G. G. Parker. (2018). "Introduction—Platforms and Infrastructures in the Digital Age." *Information Systems Research*, *29*(3).

Eaton, B., H. K. Hallingby, P.-J. Nesse and O. Hanseth. (2014). "Achieving Payoffs from an Industry Cloud Ecosystem at BankID." *MIS Quarterly Executive*, *13*(4).

Eaton, B., J. Hedman and R. Medaglia. (2017). "Three different ways to skin a cat: financialization in the emergence of national e-ID solutions." *Journal of Information Technology*, *33*(1), 70–83.

Espelid, Y., L. Netland, A. N. Klingsheim and K. J. Hole. (2008). "A Proof of Concept Attack against Norwegian Internet Banking Systems." In: G. Tsudik (Ed.), *Financial Cryptography and Data Security* (Vol. 5143, pp. 197–201). Berlin, Heidelberg: Springer Berlin Heidelberg.

European Commission. (2002, March 7). "Access Directive 2002/19/EC." Retrieved from https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=celex:32002L0019

European Commission. (2018). "The Digital Economy and Society Index." Retrieved from https://ec.europa.eu/digital-single-market/en/desi

Gjøsteen, K. (2008). "Weaknesses in BankID, a PKI-Substitute Deployed by Norwegian Banks." In: S. F. Mjølsnes, S. Mauw, & S. K. Katsikas (Eds.), *Public Key Infrastructure* (Vol. 5057, pp. 196–206). Berlin, Heidelberg: Springer Berlin Heidelberg.

Grönlund, Å. (2010). "Electronic identity management in Sweden: governance of a market approach." *Identity in the Information Society*, *3*(1), 195–211.

Hoff, J. V. and F. V. Hoff. (2010). "The Danish eID case: twenty years of delay." *Identity in the Information Society*, *3*(1), 155–174.

Hoikkanen, A., M. Bacigalupo, R. Compano and W. Lusoli. (2010). "New Challenges and Possible Policy Options for the Regulation of Electronic Identity." *Journal of International Commercial Law and Technology*, *5*, 1.

Husz, O. (2018). "Bank Identity: Banks, ID Cards, and the Emergence of a Financial Identification Society in Sweden." *Enterprise & Society*, *19*(02), 391–429.

Kubicek, H. and T. Noack. (2010). "The path dependency of national electronic identities." *Identity in the Information Society*, *3*(1), 111–153.

Lentner, G. M. and P. Parycek. (2016). "Electronic identity (eID) and electronic signature (eSig) for eGovernment services–a comparative legal study." *Transforming Government: People, Process and Policy*, *10*(1), 8–25.

Marsalek, A., T. Zefferer, F. Reimair, Ç. Karabat and E. U. Soykan. (2017). "Leveraging the Adoption of Electronic Identities and Electronic-signature Solutions in Europe." In: *Proceedings of the Symposium on Applied Computing* (pp. 69–71). New York, NY, USA: ACM.

Medaglia, R., J. Hedman and B. Eaton. (2017a). "It Takes Two to Tango: Power Dependence in the Governance of Public-Private e-Government Infrastructures."

Medaglia, R., J. Hedman and B. Eaton. (2017b). "Public-Private Collaboration in the Emergence of a National Electronic Identification Policy: The Case of NemID in Denmark." In: *50th Hawaii International Conference on System Sciences, HICSS 2017*. AIS Electronic Library (AISeL).

Melin, U., K. Axelsson and F. Söderström. (2016). "Managing the development of e-ID in a public e-service context: Challenges and path dependencies from a life-cycle perspective." *Transforming Government: People, Process and Policy*, *10*(1), 72–98.

Ministry of Transport and Communications. (2016). "Government Decree on the Trust Network for Providers of Strong Electronic Identification Services." Retrieved from http://www.finlex.fi/fi/laki/ajantasa/2016/20160169

Moe, C. E., M. Newman and M. K. Sein. (2017). "The public procurement of information systems: dialectics in requirements specification." *European Journal of Information Systems*, *26*(2), 143–163.

Murphy, A. (2012). *GSMA Mobile Identity Finnish Case Study*. Retrieved from https://goo.gl/zcJrDv

Murphy, A. (2014). *Case Study on Digital Identity Norwegian Mobile Bank ID*. GSMA Personal Data Programme. Retrieved from https://goo.gl/hxYJTf

Nordheim, S. and T. Päivärinta. (2006). "Implementing enterprise content management: from evolution through strategy to contradictions out-of-the-box." *European Journal of Information Systems*, *15*(6), 648–662.

Patala, S., L. Albareda and M. Halme. (2018). "Polycentric Governance of Privately Owned Resources in Circular Economy Systems." In: *Academy of Management Proceedings* (Vol. 2018, p. 16634). Academy of Management Briarcliff Manor, NY 10510.

Robey, D., J. W. Ross and M.-C. Boudreau. (2002). "Learning to Implement Enterprise Systems: An Exploratory Study of the Dialectics of Change." *Journal of Management Information Systems*, *19*(1), 17–46.

Seltsikas, P. and R. M. O'keefe. (2010). "Expectations and outcomes in electronic identity management: the role of trust and public value." *European Journal of Information Systems; Abingdon*, *19*(1), 93–103.

Söderström, F. (2016). *Introducing public sector eIDs: The power of actors' translations and institutional barriers* (PhD Thesis). Linköping University Electronic Press.

Söderström, F. and U. Melin. (2012). "The Emergence of a National e-ID Solution–an Actor-Network Perspective." In: *The 35th Information Systems Research Seminar in Scandinavia* (pp. 17–20).

Strauss, A. L. and J. Corbin. (1990). *Basics of qualitative research: Grounded theory procedures and applications*. Sage Publications, Newbury Park, CA.

Teece, D. J. (2018). "Profiting from innovation in the digital economy: Enabling technologies, standards, and licensing models in the wireless world." *Research Policy*.

Teigland, R., S. Siri, A. Larsson, A. M. Puertas and C. I. Bogusz. (2018). *The Rise and Development of FinTech: Accounts of Disruption from Sweden and Beyond*. Routledge.

Van de Ven, A. H. (1992). "Suggestions for Studying Strategy Process: A Research Note." *Strategic Management Journal*, *13*, 169–191.

Van de Ven, A. H. and M. S. Poole. (1995). "Explaining development and change in organizations." *Academy of Management Review*, *20*(3), 510–540.

Whitley, E. A., U. Gal and A. Kjaergaard. (2014). "Who do you think you are? A review of the complex interplay between information systems, identification and identity." *European Journal of Information Systems*, *23*(1), 17–35.

Yin, R. K. (2011). *Applications of case study research*. Sage.